

Back to the Tower

This problem reinforces students' understanding of multiples of a number and common multiples. Students must record four sets of numbers and observe where the sets intersect. To do this, they may choose to model the 105 steps on a slightly extended hundreds board. Alternatively, they may make four lists of numbers, one for each kind of decoration, and then determine which numbers appear on more than one list.

Stars and flowers appear on steps 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, 78, 84, 90, 96, and 102. Flowers and crescents appear on steps 15, 30, 45, 60, 75, 90, and 105. Stars, flowers, and diamonds appear on steps 42 and 84. Crescents, flowers, and diamonds appear on step 105. None of the steps have all four kinds of decorations.

Soon after they were married, the prince and Rapunzel realized they missed spending time in their old meeting place, the tower. So they created a path from the castle through the wild, wild woods back to Rapunzel's old home. Now they could get there easily, but how could they get up to the window?

They built a stairway—and a long stairway it was. Indeed, it had 105 steps. Rapunzel liked the new steps so much, she decided to decorate them.

Counting upward from the bottom step, Rapunzel painted stars on every second step. She painted flowers on every third step, crescent moons on every fifth step, and diamonds on every seventh step.

How many steps had stars and flowers? How many steps had flowers and crescents? How many steps had stars, flowers, and diamonds? How many steps had crescents, flowers, and diamonds? How many had all four decorations?

Back to the Tower

The prince and Rapunzel missed the tower, so they made a path from the castle through the wild, wild woods back to it. They built a long stairway up to the window. Rapunzel decided to decorate her new stairway. The stairway had 105 steps.

Counting from the bottom step:

Rapunzel painted stars on every other step.

She painted flowers on every third step.

She painted crescent moons on every fifth step.

She painted diamonds on every seventh step.

- How many steps had stars and flowers?
- How many steps had flowers and crescents?
- How many steps had stars, flowers, and diamonds?
- How many steps had crescents, flowers, and diamonds?
- How many had all four decorations?

